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THE PEDAGOGICAL SIGNIFICANCE OF THE CEPHALIC INDEX.

A DETAIL OF THE THEORY OF POPULATION.

IN a paper by G. V. de Lapouge¹ in the last number of this JOURNAL, reference was made to certain unpublished data which would furnish further confirmation of the laws formulated. Since the above article was prepared a part of the additional material referred to, gathered by Professor H. Muffang, of the Lycée de Saint-Brieuc, with the co-operation of Dr. Paul Aubry, has become available, and the skillful analysis of it at the hands of the former² serves not only further to confirm certain of the laws formulated by Lapouge, but to suggest additional generalizations of great interest.

It is an indication of the importance of the new science of anthropo-sociology for the whole range of the social sciences, that, whereas the most recent and significant of the researches, the results of which were available for summary in Lapouge's article, were concerned with matters primarily economic and financial, the investigations of Muffang, following so closely, are directly connected with problems of psychology and pedagogy.

Muffang's material is drawn from measurements of subjects resident in the department of the Côtes-du-Nord. The subjects of different categories embrace 100 conscripts of the class of 1897, 237 pupils of the lycée of Saint-Brieuc, 88 pupils of the normal school, 60 pupils of the school of St. Charles, and 100 pupils of the public schools. These groups of subjects, with the subcategories into which they are divided, give an admirable basis for the comparison of the ethnic composition not only between urban and rural residents, but also between different social classes and professions and between persons of different intellectual proclivities and attainments. The results amply justify the nicety of the methods of analysis employed, and demonstrate once more the contention which the anthropo-sociologists have frequently urged, that even in the most purely descriptive ethnic study of a given

¹ "The Fundamental Laws of Anthro-Sociology," December 1897, pp. 54-92.

² "Études d'anthro-sociologie: Écoliers et paysans de Saint-Brieuc," *Revue internationale de sociologie*, November 1897, pp. 789-803. The article is summarized with comments by Otto Ammon in the *Rundschau der Deutschen Zeitung*, January 14, 1898.

population, these sociological distinctions in regard to the subjects utilized cannot be neglected with impunity.

As this is a point of some interest in regard to the relations of anthropo-sociology with the science of ethnic statistics and analysis, it may be worth while to make it clearer by an illustration. Some years ago Dr. Fallot, of Marseilles, measured certain residents of that city who had migrated thither from the departments of Var, Alpes-Maritimes, Vaucluse, and Basses-Alpes. He naturally considered each group as fairly typical of the population of the department from which it came, and published his results as an ethnic study of the populations of these departments. When Dr. Collignon compiled his "*L'indice cephalique des populations françaises*" he as naturally accepted Fallot's figures as typical for the departments in question, and combined them with his own obtained from actual residents of the departments. But meanwhile the researches of Lapouge and Ammon were establishing the law of emigration—"that in a population in process of dissociation by displacement, it is the less brachycephalic element which emigrates more freely." In the light of this law it seemed probable that Fallot's subjects—migrants from the departments—would be less brachycephalic than Collignon's own subjects—actual residents of the same departments. Such, in fact, proved to be the case in each of the four instances.¹ This illustration indicates that the student of a given population, even for purely descriptive purposes and without any direct interest in sociological problems, cannot neglect such distinctions as that between stationary and migratory population. To the reader of Lapouge's paper it will be clear that such a student must classify his subjects with reference also to the distinctions between mountaineers and dwellers in the lowlands; between rural and urban residents; between peasants, laborers, skilled workmen, and the professional classes. It will be seen that the results of Muffang's investigations emphasize the necessity of observing these sociological distinctions. While anthropo-sociology is indebted to the descriptive science of ethnic statistics for much of its concrete material, its function is more than the merely passive one of appropriating the data, for it helps to solve puzzles that would baffle the purely descriptive anthropologists in

¹ The average cephalic indices of Fallot's subjects were: for Var, 81.70; Alpes-Maritimes, 81.80; Vaucluse, 81.18; Basses-Alpes, 83.42. Those of Collignon's own subjects were: for Var, 84.45; Alpes-Maritimes, 84.22; Vaucluse, 82.55; Basses-Alpes, 87.42.

their own field, and by showing the vital importance of the data concerned, it raises ethnic analysis from a study of merely curious interest to one of the utmost moment.

The results of Muffang's investigations are in close accord with those of Dr. Collignon, in so far as they are parallel with and comparable to the latter—that is, so far as they concern the anthropological character of the population of the department, locality by locality. The population of the Côtes-du-Nord is of a mixed character. In the region of Saint-Brieuc, and generally in the center of the department, *Homo Alpinus* (the brachycephalic element) is predominant. In the western, and again in the eastern portion of the department, there is a greater proportion of *Homo Europæus* (the dolichocephalic type). In the brachycephalic section there is a notable absence of fine churches and public buildings, the cities are dingy and dull, and the inhabitants unprogressive; in the dolichocephalic sections, on the contrary, there are fine examples of architecture, the cities are more attractive, and the population more active and intelligent. This is an interesting illustration—albeit a local one—of the artistic and intellectual superiority of the dolichocephalic. It accords with varied evidence in the same direction, drawn both from a comparison, from different points of view, of present populations and from a comparison of the monuments and remains of the one and the other race.¹

The first result of Muffang's researches is to confirm the law of urban indices: "The cephalic index of urban population is lower than that of surrounding rural populations."² The urban canton of Saint-Brieuc is found to have an average cephalic index of 84.74, the rural canton an index of 85.49. The peasants of the six neighboring rural cantons have average indices respectively of 85.07, 85.37, 85.46, 85.60, 85.63, and 86.21. A hundred pupils of the city schools have an index of 82.34. A further, more detailed proof is found in a comparison between the day scholars (*externes*) and the domiciled scholars (*internes*) of the lycée. The former group is of course more largely composed of pupils whose parents reside in Saint-Brieuc; they have an average index of 82.17. The internes who come from the surrounding rural region present an average index of 83.01. The following table shows how fully the contrast is verified in the case of each subgroup:

¹ MUFFANG, p. 791.

² LAPOUGE, "The Fundamental Laws of Anthro-Sociology," p. 70.

Classes (Classical Course)	Externes		Internes	
	No. of subjects	Index	No. of subjects	Index
Mathematics.....	3	80.96	9	81.78
Philosophy.....	4	81.08	8	85.12
Rhetoric.....	10	82.73	14	83.72
Second.....	6	82.80	10	83.04
Third.....	5	84.33	11	83.61
Fourth.....	6	81.50	9	82.14
Fifth.....	4	81.28	14	81.62
Sixth.....	9	81.83	6	83.07
Total.....	47	82.17	81	83.01

From the above it appears that in every case except the third class, the day scholars, representing in general the urban population, are more dolichocephalic than the domiciled scholars from the surrounding rural region. The exception in the case of the third class is due to the exceptional presence therein of two rurals whose indices of 90 or above raise the average against their three urban comrades.¹

We have next to consider the data in confirmation of the law of social stratification: "The cephalic index is lower and the proportion of dolichocephalics greater among the higher classes than among the lower classes in each community."² One hundred peasants of the rural canton of Saint-Brieuc have an average index of 85.49; one hundred pupils of the city schools an index of 84.33; eighty-eight pupils of the normal school, an index of 83.3; 116 scholars of the classical course in the lycée, an index of 83.55; fifty-two pupils of the school of St. Charles, an index of 83.1; and 121 scholars of the modern course of the lycée, an index of 82.39. The following table shows more in detail the ethnic composition of each of these categories; it presents the proportion among each group of subjects of different degrees of dolichocephaly and of brachycephaly (see page 258).

This table makes it clear that the proportion of subjects with indices below 80 increases, and the proportion of indices of 85 and above decreases from group to group. The force of the statistics in the present connection lies in the fact that the several groups are representative of the different social classes of the community. The peasants present only 6 per cent. of dolichocephalics. The scholars of the city

¹ MUFFANG, pp. 792-794.

² LAPOUGE, "Fundamental Laws," p. 87.

PERCENTAGE OF SUBJECTS WITH INDICES

	Between 70 and 74	Between 75 and 79	Between 80 and 84	Between 85 and 90	Between 90 and 94
Among peasants.....	1.1	6	42	46	6
Among pupils of city schools..		9	46	36	9
Among pupils of normal school		9.1	56.8	30.7	2.3
Among pupils of the classical course of the lycée.....		12.1	57.8	25.8	4.3
Among pupils of the school of St. Charles.....		15.4	59.6	21.2	3.8
Among pupils of the modern course of the lycée.....		19.8	55.4	21.5	3.3

schools with their 9 per cent. of dolichocephalics represent especially the working classes of the city mostly from families that have migrated thither from the country within one or two generations. The pupils of the normal school are drawn mostly from the same class, and present about the same proportion of indices between 75 and 79, but they are in a degree the product of selection since they presumably represent the more aspiring and capable element of their class, and they present accordingly a larger proportion of intermediate indices and a less degree of brachycephaly above 85. Finally the pupils of the lycée and of the school of St. Charles, presenting a greater proportion of low indices, and a less proportion of brachycephalic subjects, represent the higher social classes, the successful bourgeois, the public functionaries, the members of professions and the aristocracy. The position of these several classes in society corresponds with the degree of dolichocephaly in the corresponding groups. The working class is superior to the peasants, and the teacher to both of these, while the classes possessing wealth and influence hold the teacher, in social, political, and even intellectual matters, pretty much under their thumb—as indeed they have been known to do upon occasion in other countries than France.

The law of social stratification is further confirmed by a direct comparison between subjects representing different occupations and professions. Ten workmen of Saint-Brieuc averaged 160 millimeters in head breadth, 190 in head length, and 84.21 in index. Ten common laborers averaged 161 in breadth, 188 in length, and 85.63 in index. The head dimensions of ten sons of teachers averaged 161 and 185 giving an index of 87.02. This high index is accounted for partly on the basis of their distinctly rural origin, but even allowing for this

it would appear that some disturbing factor has entered into the selection of these ten subjects and that they are not fairly representative of the class of teachers. A more typical average may probably be obtained by utilizing also the index of 83.3 prevailing among the eighty-eight pupils of the normal school. The head dimensions of ten sons of notaries averaged 153 and 185, and those of ten sons of physicians, 154 and 189; the indices of these two groups were respectively 82.70 and 81.48. Muffang explains the difference in dimensions and index in favor of the sons of physicians from the fact that to enter this profession requires, in France, higher faculties and more strenuous efforts than to become a notary.¹ Making the qualification already noted in regard to the teaching class, and bearing in mind the fact that the sons of professional men were younger than the laborers and peasants measured and that the absolute dimensions of the head had not therefore in their case attained their highest point, it appears that the length of the head is greater and the cephalic index lower in the professions than in the common callings.

The next of the laws formulated by Lapouge, which is affected by the researches of Muffang, is the law of the intellectual classes: "Among intellectual workers the absolute dimensions of the head (and particularly the breadth), are greater than the average." It is a fair question whether the generalization thus stated by Lapouge is not somewhat premature, and whether it will not have to be modified or elaborated in the light of the data at present available. The evidence indeed supports the main proposition that among intellectual workers the absolute dimensions of the head are, in general, greater than the average, but it does not altogether sustain the subproposition that it is in point of breadth that the increase is most marked. Indeed Muffang's results, together with other data that may be cited, point in just the opposite direction, and indicate that the increase in head length is more marked than in head breadth. It may be noted in this connection that Muffang in his citation of the law from Lapouge has, apparently through inadvertence, substituted the word "length" for the word "breadth,"² and has fallen, therefore, into the error of regarding his results as confirming Lapouge's statement of the law, whereas

¹ Cf. LAPOUGE, "Fundamental Laws," p. 91.

² "D'après cette loi [loi des intellectuels], dans la catégorie des travailleurs intellectuels, les dimensions absolues du crâne, *et particulièrement la longueur*, sont plus élevées."—MUFFANG, p. 798. The manuscript from which LAPOUGE's article

they really tend to refute the subproposition of that statement, although confirming the main proposition thereof.

Muffang's citation of the law, however, although inaccurate as a citation of Lapouge's statement, may perhaps be nearer the real facts. We may here cite certain of the evidence bearing in this direction, reserving our final opinion until more extensive data shall have been accumulated and interpreted.

One bit of evidence may be taken from Lapouge himself. "This law," says that author, "was long ago formulated by Durand de Gros, who, working at Rodez, found the length and breadth of the head among the educated respectively 187^{mm} and 155^{mm}; among the uneducated respectively 180 and 151."¹ Now in this instance the larger head dimensions of the educated classes are more marked in the direction of length than in that of breadth. It is the intellectual group that is more dolichocephalic, their index being 82.90 as against 83.89 for the uneducated.

Another bit of evidence in the same direction is Ammon's study of the head dimensions of the *Gelehrten* and friends of science. Ammon measured and compared with various groups of the population some thirty members of the Karlsruhe Society of Natural Sciences representing men of high standing in various callings and with a common interest in science. The average index was 80.8 against 81 for the students of urban origin in the upper classes of the gymnasium, 82.9 for those in the lower classes, and 83.5 for the average population of Baden. The average head length was 192^{mm} against 186, 183, and 184 for the other groups respectively. The head breadth was 155^{mm}, against 151, 151 and 154 for the other groups respectively. A further interesting test was furnished by the circumstance that on the evening for which the investigation was planned the exceptional severity of the

was translated for the December number of this JOURNAL read *largeur* instead *longueur*. That such was LAPOUGE's meaning is clearly shown by the context of his whole discussion of the law, and especially by the following passage: "This law of the intellectual classes tends to come into seeming conflict with the law designated above as the law of stratification. The intellectual worker tends to possess *an exceptional breadth of head more marked than the exceptional length*. He is likely then to be *less dolichocephalic* than the average of his social compeers; he is likely to possess a degree of eurycephaly which may be easily confused with brachycephaly."—LAPOUGE, *Fundamental Laws*, p. 91. Cf., also, the parallel passages in the Italian translation, *Rivista italiana di sociologia*, November 1897.

¹ LAPOUGE, *Fundamental Laws*, p. 90.

weather kept away all but twelve members who had a manifestly unselfish interest in science. This elite dozen had the same head breadth as the others, but in head length they average full six millimeters superior. Their average head length was 195 and their cephalic index 79.6.¹

Evidence resting on much more extensive data and therefore of more unmistakable significance may be cited from the same author's comparison between the students of the upper classes and those of the lower classes (*Unter-Secunda*) in the gymnasia of Karlsruhe, Freiburg, and Mannheim. The reader may have noted that in the statistics of the preceding paragraph the lower class students are more brachycephalic than those of the upper classes. This same distinction holds good in the case both of the humanistic *gymnasia* and the *real gymnasia* of the several cities, and with one slight exception in each of the subgroups into which Ammon classifies his subjects: (1) migrants to the city; (2) "half citizens" or sons of migrants; (3) "citizens proper" or subjects whose fathers as well as they themselves were native of the city in question. The uniformity with which the distinction holds good is shown in the following tables:

COMPARISON OF CEPHALIC INDEX BETWEEN THE UPPER CLASSES AND UNTER-SECUNDA IN THE GYMNASIUM OF FREIBERG.

	Upper Classes	Unter-Secunda
Among migrants to city.....	81.1	83.1
Among "half citizens".....	83.1	82.6
Among "citizens proper".....	81.9	83.9

COMPARISON OF CEPHALIC INDEX BETWEEN UPPER CLASSES AND UNTER-SECUNDA IN THE GYMNASIA OF KARLSRUHE AND MANNHEIM.

	Karlsruhe		Mannheim		The humanistic gymnasia of both cities		The real gymnasia of both cities	
	Upper classes	Unter-Secunda	Upper classes	Unter-Secunda	Upper classes	Unter-Secunda	Upper classes	Unter-Secunda
Among migrants to city..	82.6	81.3	82.7	83.9	83.4	84.3	82.2	82.6
Among "half citizens" ..	82.9	83.6	80.7	81.7	82.4	82.8	83.2	83.4
Among "citizens proper".	80.9	84.2	81.1	81.9	80.9	83.5	80.9	83.5

¹ AMMON, *Die Natürliche Auslese beim Menschen*, § 327.

The corresponding figures in relation to head length are yet a trifle more uniform. Without exception, in each of the above categories the upper classes have considerably the greater head length.

The obvious interpretation of these figures would be that it is the students of larger head dimensions and particularly of greater head *length* who show the greater disposition and ability to complete their course of study. But the real force of the data appears yet more sharply when it is remembered that the lower classes of the gymnasia are swelled by pupils who attend less from any real scholarly interest than in order to secure partial exemption from military service. Among the upper classes this powerful motive no longer applies. It is then the small heads and the *round* heads who drop their course of study as soon as they have secured partial exemption from military duty. It is the pupils of larger head dimensions and particularly of greater head *length* who keep on from an intrinsic interest in study.¹

To return to Muffang's statistics, it appears that (with the exception soon to be noted) students with the greater head length and generally with the greater degree of dolichocephaly are the more successful. This is indicated in detail in the following table :

	Head length		Cephalic index	
	Good students	Poor students	Good students	Poor students
NORMAL SCHOOL.				
Third year	190.3	188.8	82.34	82.58
Second year	190.5	189.4	83.30	83.21
First year	188.8	188.2	82.20	83.79
SCHOOL OF ST. CHARLES.				
Naval course	187.6	184.4	82.41	83.62
LYCÉE, MODERN COURSE.				
Mathematics	192.2	192.4	80.02	83.40
Second modern	193.0	191.6	81.03	81.16
Third modern	193.8	190.2	81.52	81.07
Course of Angers	190.0	187.8	82.10	82.05
Fourth modern	189.6	186.5	83.65	83.16
Fifth modern	186.8	185.0	82.65	82.70
Sixth modern	189.7	180.7	79.96	83.40
Total	190.1	187.6	82.01	82.92

We have now to consider the exception to which reference has just been made and its significance as regards the psychology of race. The

¹ AMMON, *Natürliche Auslese*, § 270, chaps. vii and viii.

reader may have noted that in the first table cited from Muffang, the students in the modern course of the lyc  e presented a larger proportion of low indices and a smaller proportion of high indices than the pupils in the classical course. The former group of students contained about 20 per cent. of dolichocephalics, the latter group about 12 per cent.; while of brachycephalic indices (85 and above) the percentage in the two groups was respectively 25 and 30. In a word, the scholars in the modern course are more dolichocephalic than their classical comrades. This is to a degree explained by the fact that the pupils of the modern course are more largely drawn from the dolichocephalic portions of the province, whereas the classical scholars pertain rather to the brachycephalic portions. But this only carries the explanation a stage further back; the fact remains that the dolichocephalics choose rather the modern studies, while the brachycephalics prefer in greater degree the classical curriculum.

Not only this. It appears further that, whereas in the modern courses of the lyc  e, the school of St. Charles, and the normal school, it was the pupils of greater head length and in general of lower index who succeeded best, in the classical courses the reverse is the case, and the successful pupils are the more brachycephalic, with heads usually somewhat shorter and in general also a trifle broader. This appears in detail in the following table:

	Head length		Cephalic index	
	Good scholars	Poor scholars	Good scholars	Poor scholars
SCHOOL OF ST. CHARLES.				
Philosophy	191.1	194.0	82.10	80.56
Rhetoric	185.4	184.6	84.41	82.50
Second	183.2	186.1	84.60	83.34
LYC��E.				
Philosophy.....	189.2	193.6	84.90	83.50
Rhetoric.	188.0	191.0	85.60	82.20
Second	185.7	188.7	84.70	83.50
Third.....	188.8	189.4	85.40	82.70
Fourth.....	184.5	185.6	81.84	81.89
Fifth	187.0	184.0	82.35	81.52
Sixth	181.6	178.3	81.81	84.83
Total.....	186.45	187.53	83.81	82.72

What, then, is the reason that the dolichocephalic, although he is

probably of higher intellectual capacity, and although he surpasses his brachycephalic comrade in scientific and modern studies, is inferior to the latter in meeting the requirements of the ordinary classical routine? Muffang suggests an explanation which we will summarize substantially in his own words:

It may well be that the brachycephalic is suited for the classical routine in virtue of his cerebral and psychic organization. "The brachycephalic," says Lapouge, "is the child of tradition; progress appears to him wholly unnecessary and indeed excites his suspicion."¹ Modern science with its revolutionary tendencies appalls rather than attracts him. He prefers to study Latin as the curate and the local aristocrats of his community have done before him. He thinks the classical course better suited for the education of a gentleman, and very likely values his diploma mainly as a key to social prestige. By hereditary disposition patient, and tenacious, he conforms easily to severe requirements of memorizing, and is an ideal scholar so long as no original thinking is demanded. The dolichocephalics (with the exception of a few who take up the classics from a real love of the subject, and who excel therein their brachycephalic comrades, especially in original work) rebel at the formality of grammar, the drudgery of memorizing, and the remoteness of these studies from the actual problems of thought and life. They accordingly chose the modern courses, or if they remain in the classics, they, like the hare in the table, allow themselves to be beaten by their more tortoise-like competitors.²

Such being Muffang's results and explanation as to the respective proclivities and success in study of the two ethnic types, we may turn for comparison to a somewhat parallel investigation of Otto Ammon. The results of the two investigations appear at first glance to be at variance. Ammon found in Baden no such uniform distinction in head form between students of classical and modern courses as our author finds in the Côtés-du-Nord.³ It is indeed true that both at Karlsruhe and at Mannheim, and both among the upper classes and among the *Unter Secunda* the average head length is always as great or greater for the real gymnasium as for the humanistic gymnasium,⁴ but the average head breadth and accordingly the index, and the proportions, respectively of long heads and short heads in the several categories, vary in such a complex way as to make any generalization (except the very clear one, noted above, of the greater dolichocephaly of the upper classes as opposed to the *Unter-Secunda*) very difficult.

¹ LAPOUGE, *Les sélections sociales*, pp. 17 ff.

² MUFFANG, pp. 801-803.

³ AMMON, *Natürliche Auslese*, §§ 262, 269.

⁴ *Ibid*, § 273.

Are we then to infer that the contrast in head form between classical students and students of modern branches that appears in Muffang's investigations is the result either of mere chance or of purely local conditions? I incline rather to the opinion that it is the form and statement of his conclusion rather than the substance of it, that is affected by the comparison with Ammon. The two courses of study and the motives for choosing one or the other may well be very different in the German gymnasium and the French lyc  e. The pursuit of the classical course in these secondary schools may be less distasteful in Germany than in France to the thoughtful and progressive student, either because it is less dryly and pedantically conducted, or because it is the stepping-stone to the alluring possibilities of the university. If, therefore, we prefix to the generalization, as stated by Muffang, the proviso that the classical course in the given case is pedantic in method and sterile in results, it is probable from what we know of the psychology of *Homo Europ  us* that he will either fight shy of it altogether or pursue it with only indifferent enthusiasm or success.

If further researches support this modified conclusion, an interesting light will be thrown on the contention between the partisans of the classic and the advocates of modern and scientific branches. The educational system has two great functions. In the first place its obvious purpose is to awaken and develop the capacities of students. In the second place, its less obvious utility lies in its function as a selective agency. Through the competition and the tests afforded, the capable and ambitious gain entrance to the higher callings, or at any rate the equipment that helps them to reach their due place in the social order. On the other hand, there is the beginning of that necessary rejection and limitation for the incompetent that will continue in real life, and that is a necessary condition of the social evolution.

This selective function of education is usually overlooked in pedagogical discussion. Yet it is important that the educational system be such as to select and advance toward positions of influence and prosperity, the type of men that will be most useful to society. If, then, it appears that the classical curriculum (under widely prevailing conditions) is a selection of the less fit, anthropo-sociology will have supplied a new method of approaching certain fundamental problems of education.¹

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¹ Cf. MUFFANG, pp. 802-803.